IN THE SPECIFICATION

Please amend the paragraph at page 1, line 22 to page 2, line 5 as follows:

For example, the coding operation takes place at the level of the bit. This operation associates with a binary sequence of useful information a binary sequence [[o f]] of corresponding coded information. This binary sequence of coded information is referred to as the code word when the size of the binary sequences of useful information is fixed. The binary sequence of coded information is of greater size than the binary sequence of useful information so as to introduce redundancy. Because of [[o f]] this redundancy, only certain coded information sequences, in accordance with the coding law, are possible. If received information sequences to be decoded are different from these possible sequences, it is because they correspond to information impaired by the channel. The role of the decoding method will therefore be to reconstitute the useful information as well as possible from the received information sequence, knowing the coding law used. It is known how to decode the most simple codes in optimum fashion, that is to say by finding, amongst the possible sequences, the most likely sequence. For the more complex codes such as turbo codes, the limiting factor is in general the complexity of the decoder.

Please amend the paragraph at page 3, line 15 to page 4, line 6 as follows:

A high-performance type of combination of coders has been proposed, as described notably in the document "Near Shannon Limit Error-Correcting Coding and Decoding: Turbo-codes" by C. Berrou, A. Glavieux and P. Thitimajshima, which appeared in ICC-1993, Conference Proceedings, on pages 1064-1070. This type of combination of coders has given rise to a family of coding schemes known in the art as turbo codes. The term turbo codes will be given to error correcting codes based [[o n]] on the combination, referred to as

concatenation, of several simple codes, referred to as elementary codes, with the intervention of permutation operations, referred to as interleavings, which modify the order of taking into account of the data by each of the simple codes. For example, one type of conventional interleaving, referred to as uniform interleaving, is obtained by means of an interleaving matrix in which the source data are introduced row by row and retrieved column by column. In general, in order to improve the performance, the turbo codes use non-uniform interleavings. Elementary codes means codes with an efficiency greater than or equal to 1, of the type described above. It may, for example, be a case of recursive systematic convolutional codes for convolutional turbo codes, Hamming block codes or BCH for block turbo codes. Different types of concatenation can be envisaged. In parallel concatenation, the same information is coded for each coder separately after having been interleaved. In serial concatenation, the output of each coder is coded by the following coder after having been interleaved. The term dimension of the turbo code refers to the number of elementary coders used for implementing this turbo code. A well known turbo coding scheme consists of a parallel concatenation of elementary codes of the recursive systematic convolutional (RSC) code, type. This turbo code is referred to by the term PCCC. Examples of turbo codes with serial concatenation are SCCCs which use elementary codes of the convolutional code type and block turbo codes which use elementary codes of the block code type.

Please amend the paragraph at page 13, line 22 to page 14, line 12 as follows:

Each of the elementary coders 11 and 12 is a coder using a recursive systematic convolutional (RSC) code. As is well known, each of these elementary coders uses a series of auxiliary information items, stored in a device of the shift register type, each obtained by the mathematical combination of a useful information item and auxiliary information items

calculated previously. In the example presented here, the shift register 23 stores the auxiliary data calculated by the exclusive OR 21 whose inputs give the first generator polynomial of the RSC coder 11. The convolution product is produced by the exclusive OR 22, the outputs of the register 23 give the second generator polynomial of the RSC coder 11. The useful information item 19 is systematically transmitted alongside redundant information items 17, 18 which appear_at the output of the exclusive OR operators 22 [[, 23]]. The interleaving step 13 of size N modifies the order in which the data are taken into account by each of the elementary codes. In this way, each of the coders 11 and 12 generates a redundant information item which is associated with it. The useful information item is transmitted only once. Thus the coded information item as it appears from the coding procedure is a block 20 comprising the useful information item, or systematic part, and the two redundant information items, or parts of the coded information item corresponding to each of the elementary codes. Naturally, the two elementary codes could be different. After multiplexing 14, the coded information can be subjected to puncturing 15. The efficiency of each of the elementary coders is ½ and, because the systematic part is transmitted only once, the efficiency R of the turbo code is 1/3. This efficiency can of course be increased by puncturing. Thus the puncturing of half of the redundant bits of each elementary code would produce an efficiency R of ½.

Please amend the paragraph at page 15, line 29 to page 17, line 2 as follows:

At the start, the extrinsic information $e2_0$ is initialised to 0. During the first iteration, the systematic information X forms the a priori input information of the first elementary decoder 32. The first elementary decoding, as from the first redundant information item Y1, produces a weighted output information item $D1_1$, corresponding to a first decoding sequence

estimation, and written in the form of a combination of the systematic information and the extrinsic information $e1_1$, the latter corresponding to an increase in the reliability associated with the first elementary decoding. $D1_1 = X + e1_1$, the extrinsic information $e1_1$ being written as the difference between the weighted output information of the first decoder, here the output log likelihood ratio, and the weighted input information [[o]] of the first decoder, here the input log likelihood ratio. This extrinsic information $e1_1$, interleaved and added to the interleaved systematic information X', forms the a priori input information of the second elementary decoder 33. The second elementary decoding, from the second redundant information item Y2, produces a weighted output information item $D'2_1$, which corresponds to a second decoding sequence estimation, and which is written in the form of a combination of the interleaved systematic information, the interleaved extrinsic information $e'1_1$ and the interleaved extrinsic information $e'2_1$, the latter corresponding to an increase in the reliability associated with the second elementary decoding. $D'2_1 = X'+e'1_1+e'2_1$, the interleaved extrinsic information $e'2_1$ being written as the difference between the weighted output information of the second decoder, here the output log likelihood ratio, and the weighted input information of the second decoder, here the input log likelihood ratio. The interleaved extrinsic information $e'2_1$ forms, after deinterleaving, the extrinsic information $e2_1$ which, added to the systematic information X, forms the input a priori information of the first elementary decoder 32 for the second iteration. The elementary decoding, still from the first redundant information item Yl, then produces a weighted output information item $D1_2$, which corresponds to a new decoding sequence estimation of increased reliability. A new extrinsic information item associated with the decoder 32 $e1_2$, interleaved and added to the interleaved systematic information X', forms the a priori input information of the second elementary decoder 33. The second elementary decoding, still from the second redundant information

item Y2, produces a weighted output information item $D'2_2$, which corresponds to yet another new decoding sequence estimation of increased reliability. A new extrinsic information item associated with the decoder 33 $e2_2$, added to the systematic information X, forms the a priori input information of the first elementary decoder 32 for the third iteration. The process then continues in the same way, the extrinsic information, as the iterations progress, gaining in reliability, that is to say in amplitude in the present case where it is expressed in terms of likelihood ratio logarithm. At the end of the decoding procedure, after a number of iterations k whose determination will be explained below, the interleaved decoding sequence composed of the weighted output information items $D'2_k$ at the output of the second elementary decoder 33 is deinterleaved and thresholded in order to produce the decoded sequence.

Please insert the following paragraph at page 22, after line 1:

-- The claimed invention is: --